

Memorandum

Environmental
Resources
Management

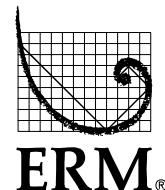
To: Todd Slater - Legacy Site Services, LLC
Larry Patterson - Arkema Inc.

From: William Park, Erik Ipsen - ERM-West, Inc.

Date: 19 April 2006

Subject: In-Situ Persulfate Oxidation Interim Remedial Measure Status Update

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INTRODUCTION

This memorandum presents a summary of activities conducted during implementation of the In-Situ Persulfate Oxidation Interim Remedial Measure (IRM) at the Arkema Inc. (Arkema) facility in Portland, Oregon. Arkema contracted ERM-West Inc. (ERM) to implement this IRM. The procedures and field activities followed during implementation of this IRM are outlined in the *In-Situ Persulfate Oxidation Interim Remedial Measure Work Plan* (Work Plan), dated 7 July 2005.

SITE PREPARATION

Monitoring Well Installation

Several areas were identified during the design of the IRM where monochlorobenzene (MCB) and/or DDT concentrations were not well delineated. A total of nine additional shallow, two additional shallow-intermediate, and six additional intermediate zone monitoring wells were installed in these areas to better understand groundwater conditions. Of these additional wells, four shallow and three intermediate zone wells were installed as part of the Hexavalent Chromium Reduction IRM, which is being implemented concurrently with this IRM. An additional five shallow zone, two shallow-intermediate zone, and three intermediate zone monitoring wells were installed as part of this IRM.

Oxidant Mixing and Delivery

The oxidant mixing procedure described in the Work Plan specified dissolving solid sodium persulfate in water on site to the required concentration for injection. The sodium persulfate was diluted and buffered with sodium hydroxide at an off-site facility and delivered to the site as a 38 percent (weight) solution. Arkema staff unloaded the truck and diluted the 38 percent solution to either a 2 percent (weight) or 15 percent (weight) for injection.

PHASE I INJECTIONS

The Phase I injection locations are shown in Figure 1. Sodium persulfate solution was only injected in the shallow and shallow-intermediate aquifers during Phase I. Between 6 September and 27 September 2005, a total of 5,767 gallons of 2 percent solution were injected at 23 locations, and 70,691 gallons of 15 percent solution were injected at 83 locations.

GROUNDWATER MONITORING RESULTS

Prior to injections, ERM collected baseline groundwater samples from monitoring wells located within the entire IRM area to establish baseline conditions. Several wells had previously been sampled during the implementation of the In-Situ Air Sparge and Soil Vapor Extraction (IAS/SVE) IRM. Groundwater samples were submitted North Creek Analytical for chemical analysis in accordance with the sampling matrix presented in the Work Plan.

ERM collected groundwater samples for measurement of field parameters in early October 2005, two weeks after completion of Phase I injections. ERM also collected groundwater samples for laboratory analysis during three monthly rounds of performance monitoring in October 2005, November 2005, and January 2006. Performance monitoring was limited to only those wells in the Phase I treatment area, as detailed in Table 2 of the Work Plan.

The organic compound analytical results for the IRM area are presented in Table 1. Pesticide and volatile organic compound (VOC) results for wells sampled for the IAS/SVE IRM are also included in Table 1. The inorganic analysis results for the baseline and performance monitoring events are presented in Table 2. The field parameter results from the baseline and performance monitoring events are presented in Table 3.

The MCB and pesticide concentrations reported during the performance monitoring from Phase I of the Persulfate Oxidation IRM fluctuated widely. Similar results have been observed in the performance monitoring for the concurrently running IAS/SVE IRM. These results, and the results of additional investigations, suggest that MCB DNAPL may be present in larger quantities and distributed over a larger area than originally anticipated.

IRM STATUS

Given the uncertain distribution of DNAPL and potential recontamination of treated areas, the in-situ Persulfate Oxidation IRM is currently on hold, pending evaluation of source control alternatives for the residual MCB DNAPL.

If you have questions or require additional information, please contact me at (425) 462-8591.

Sincerely,



William A. Park
Task Manager



Erik C. Ipsen, P.E.
Project Manager



David P. Edwards, P.G.
Partner

cc: Matt McClincy - Oregon DEQ

Tables

Table 1

Groundwater Organic Analytical Results
 Persulfate Oxidation Interim Remedial Measure
 Arkema, Inc. Facility
 Portland, Oregon

Sample Number	Date	Acetone (µg/L)	Benzene (µg/L)	Bromo-chloro-methane (µg/L)	Bromo-dichloro-methane (µg/L)	Carbon disulfide (µg/L)	Carbon tetrachloride (µg/L)	Chlorobenzene (µg/L)	Chloroethane (µg/L)	Chloroform (µg/L)	Chloromethane (µg/L)	Dibromo-chloro-methane (µg/L)	Dibromo-methane (µg/L)	1,2-Dichlorobenzene (µg/L)	1,4-Dichlorobenzene (µg/L)	1,1-Dichloroethane (µg/L)
Shallow Zone																
MWA-2-062205	6/22/05	ND (<234)	ND (<14.7)	ND (<26.6)	ND (<18.3)	ND (<23.3)	ND (<14.0)	12200	ND (<32.7)	99.0	ND (<15.9)	ND (<13.3)	ND (<11.7)	ND (<8.59)	ND (<18.7)	ND (<15.7)
MWA-2-091505	9/15/05	ND (<468)	ND (<29.4)	ND (<53.2)	ND (<36.6)	ND (<46.6)	ND (<28.0)	21900	ND (<65.4)	182	ND (<31.8)	ND (<26.6)	ND (<23.4)	ND (<17.2)	ND (<37.4)	ND (<31.4)
MWA-2-102705	10/27/05	ND (<468)	ND (<29.4)	ND (<53.2)	ND (<36.6)	ND (<46.6)	ND (<28.0)	23500	ND (<65.4)	204	ND (<31.8)	ND (<26.6)	ND (<23.4)	ND (<17.2)	ND (<37.4)	ND (<31.4)
MWA-2-011306	1/13/06	ND (<2.34)	ND (<0.147)	ND (<0.266)	ND (<0.183)	ND (<0.233)	ND (<0.140)	4.04	ND (<0.327)	2.37	ND (<0.159)	ND (<0.133)	ND (<0.117)	ND (<0.0859)	ND (<0.187)	ND (<0.157)
MWA-3-062205	6/22/05	ND (<117)	ND (<7.35)	ND (<13.3)	ND (<9.15)	ND (<11.6)	ND (<7.00)	7490	ND (<16.4)	88.5	ND (<7.95)	ND (<6.65)	ND (<5.85)	ND (<4.30)	ND (<9.35)	ND (<7.85)
MWA-3-091505	9/15/05	ND (<23.4)	ND (<1.47)	ND (<2.66)	ND (<1.83)	ND (<2.33)	ND (<1.40)	1110	4.00 J	80.2	ND (<1.59)	ND (<1.33)	ND (<1.17)	ND (<0.0859)	ND (<1.87)	ND (<1.57)
MWA-3-102605	10/26/05	162	ND (<0.735)	ND (<1.33)	ND (<0.915)	1.55 J	7.65	571	8.05	94.8	101	ND (<0.665)	ND (<0.585)	0.900 J	2.20 J	0.950 J
MWA-3-112205	11/22/05	261	ND (<2.94)	ND (<5.32)	ND (<3.66)	ND (<4.66)	4.80	1900	10.8	102	69.8	ND (<2.66)	ND (<2.34)	ND (<1.72)	ND (<3.74)	ND (<3.14)
MWA-3-011306	1/13/06	ND (<11.7)	ND (<0.735)	ND (<1.33)	1.95 J	ND (<1.16)	53.8	727	ND (<1.64)	235	ND (<0.795)	ND (<0.665)	ND (<0.585)	ND (<0.430)	ND (<0.935)	ND (<0.785)
MWA-4	7/29/05	ND (<23.4)	ND (<1.47)	ND (<2.66)	ND (<1.83)	ND (<2.33)	ND (<1.40)	1040	ND (<3.27)	1.7 J	ND (<1.59)	ND (<1.33)	ND (<1.17)	1.70 J	3.50 J	ND (<1.57)
MWA-4-102605	10/26/05	49.4 J	ND (<0.735)	ND (<1.33)	ND (<0.915)	ND (<1.16)	ND (<0.700)	456	9.90	28.6	164	ND (<0.665)	ND (<0.585)	1.65 J	3.80	1.80 J
MWA-4-112205	11/22/05	80.9	ND (<0.294)	ND (<0.532)	ND (<0.366)	ND (<0.466)	ND (<0.280)	252	5.80	21.8	95.0	ND (<0.266)	ND (<0.234)	0.900 J	2.04	1.06
MWA-4-011306	1/13/06	ND (<117)	ND (<7.35)	ND (<13.3)	ND (<9.15)	ND (<11.6)	ND (<7.00)	4250	17.5 J	31.5	9.50 J	ND (<6.65)	ND (<5.85)	ND (<4.30)	ND (<9.35)	ND (<7.85)
MWA-05	7/28/05	16.5 J	ND (<0.147)	ND (<0.333)	ND (<0.266)	ND (<0.233)	ND (<0.140)	11.5	2.76	ND (<0.143)	ND (<0.159)	ND (<0.133)	ND (<0.117)	ND (<0.0859)	ND (<0.187)	0.770
MWA-5-102705	10/27/05	3.16 J	ND (<0.147)	ND (<0.266)	ND (<0.183)	ND (<0.233)	ND (<0.140)	15.0	7.99	ND (<0.143)	ND (<0.159)	ND (<0.133)	ND (<0.117)	ND (<0.0859)	ND (<0.187)	1.82
MWA-5-112105	11/21/05	ND (<2.34)	ND (<0.147)	ND (<0.266)	ND (<0.183)	ND (<0.233)	ND (<0.140)	17.2	8.37	ND (<0.143)	ND (<0.159)	ND (<0.133)	ND (<0.117)	ND (<0.0859)	ND (<0.187)	0.980
MWA-5-011606	1/16/06	ND (<2.34)	ND (<0.147)	ND (<0.266)	ND (<0.183)	ND (<0.233)	ND (<0.140)	14.0	0.980	ND (<0.143)	ND (<0.159)	ND (<0.133)	ND (<0.117)	ND (<0.0859)	ND (<0.187)	0.600
MWA-6R	8/1/05	ND (<2.94)	ND (<5.32)	ND (<3.66)	ND (<4.66)	ND (<2.80)	2970	ND (<6.54)	3.6 J	ND (<3.18)	ND (<2.66)	ND (<2.34)	ND (<1.72)	ND (<3.74)	ND (<3.14)	
MWA-15R-062205	6/22/05	ND (<2340)	ND (<147)	ND (<266)	ND (<183)	ND (<233)	ND (<140)	87700	ND (<327)	ND (<143)	ND (<159)	ND (<133)	ND (<117)	ND (<85.9)	ND (<187)	ND (<157)
MWA-15R-091605	9/16/05	ND (<4680)	ND (<294)	ND (<532)	ND (<366)	ND (<466)	ND (<280)	240000	ND (<654)	ND (<286)	ND (<318)	ND (<266)	ND (<234)	ND (<172)	ND (<374)	ND (<314)
MWA-18	8/3/05	ND (<2.34)	ND (<0.147)	ND (<0.266)	ND (<0.183)	ND (<0.233)	ND (<0.140)	0.580	ND (<0.327)	0.26 J	ND (<0.159)	ND (<0.133)	ND (<0.117)	ND (<0.0859)	ND (<0.187)	ND (<0.157)
MWA-19	8/3/05	ND (<2.34)	ND (<0.147)	ND (<0.266)	ND (<0.183)	0.330 J	ND (<0.140)	3.14	ND (<0.327)	0.35 J	ND (<0.159)	ND (<0.133)	ND (<0.117)	ND (<0.0859)	ND (<0.0187)	0.850
MWA-20	8/4/05	ND (<23.4)	ND (<1.47)	ND (<2.66)	ND (<1.83)	2.40 J	ND (<1.40)	1540	ND (<3.27)	ND (<1.43)	ND (<1.59)	ND (<1.33)	ND (<1.17)	ND (<0.859)	ND (<1.87)	ND (<1.57)
MWA-22	8/1/05	ND (<117)	ND (<7.35)	ND (<13.3)	ND (<9.15)	ND (<11.6)	ND (<7.00)	6460	ND (<16.4)	ND (<7.15)	ND (<7.95)	ND (<6.65)	ND (<5.85)	ND (<4.30)	ND (<9.35)	ND (<7.85)
MWA-30	8/3/05	34.2	ND (<0.147)	ND (<0.266)	ND (<0.183)	ND (<0.233)	ND (<0.140)	ND (<0.136)	0.370 J	2.13	ND (<0.159)	ND (<0.133)	ND (<0.117)	ND (<0.0859)	ND (<0.187)	ND (<0.157)
MWA-42	8/2/05	13.9 J	0.180 J	ND (<0.266)	ND (<0.183)	1.06	ND (<0.140)	94.0	ND (<0.327)	1.28	ND (<0.159)	ND (<0.133)	ND (<0.117)	ND (<0.0859)	ND (<0.187)	0.170 J
MWA-44	8/3/05	ND (<11.7)	1.45 J	ND (<1.33)	ND (<0.915)	ND (<1.16)	ND (<0.700)	851	ND (<1.64)	5.40	ND (<0.795)	ND (<0.665)	ND (<0.585)	ND (<0.430)	ND (<0.935)	1.60 J
MWA-45	8/3/05	ND (<2.34)	1.41	ND (<0.266)	ND (<0.183)	2.56	ND (<0.140)	62.9	ND (<0.327)	12	ND (<0.159)	ND (<0.133)	ND (<0.117)	ND (<0.0859)	ND (<0.187)	1.54
MWA-46	8/4/05	ND (<2.34)	0.450 J	ND (<0.266)	ND (<0.183)	ND (<0.233)	ND (<0.140)	40.2	ND (<0.327)	0.190 J	0.200 J	ND (<0.133)	ND (<0.117)	ND (<0.0859)	ND (<0.187)	2.52
MWA-60	8/2/05	ND (<11.7)	1.65 J	ND (<1.33)	ND (<0.915)	ND (<1.16)	ND (<0.700)	576	ND (<1.64)	ND (<0.715)	ND (<0.795)	ND (<0.665)	ND (<0.585)	ND (<0.430)	ND (<0.935)	3.00
MWA-60-102705	10/27/05	ND (<11.7)	1.10 J	ND (<1.33)	ND (<0.915)	ND (<1.16)	ND (<0.700)	667	ND (<1.64)	ND (<0.715)	ND (<0.795)	ND (<0.665)	ND (<0.585)	ND (<0.430)	ND (<0.935)	ND (<0.785)
MWA-60-112105	11/21/05	57.4	0.170 J	ND (<0.266)	ND (<0.183)	0.										

Table 1

Groundwater Organic Analytical Results
 Persulfate Oxidation Interim Remedial Measure
 Arkema, Inc. Facility
 Portland, Oregon

Sample Number	Date	1,2-Dichloroethane ($\mu\text{g/L}$)	1,1-Dichloroethene ($\mu\text{g/L}$)	cis-1,2-Dichlorethane ($\mu\text{g/L}$)	trans-1,2-Dichloroethene ($\mu\text{g/L}$)	Methylene chloride ($\mu\text{g/L}$)	Naphthalene ($\mu\text{g/L}$)	Tetrachlorethene ($\mu\text{g/L}$)	Toluene ($\mu\text{g/L}$)	1,1,1-Trichloroethane ($\mu\text{g/L}$)	Trichloroethene ($\mu\text{g/L}$)	Vinyl chloride ($\mu\text{g/L}$)	DDT ($\mu\text{g/L}$)	DDD ($\mu\text{g/L}$)	DDE ($\mu\text{g/L}$)
Shallow Zone															
MWA-2-062205	6/22/05	ND (<14.2)	ND (<19.7)	ND (<17.0)	ND (<17.5)	ND (<100)	ND (<9.89)	17.0 J	ND (<15.5)	ND (<8.59)	ND (<24.1)	ND (<15.2)	ND (<0.500)	3.35	ND (<5.00)
MWA-2-091505	9/15/05	ND (<28.4)	ND (<39.4)	ND (<34.0)	ND (<35.0)	ND (<200)	ND (<19.8)	24.0 J	ND (<31.0)	ND (<17.2)	ND (<48.2)	ND (<30.4)	0.0789 J	0.187	ND (<0.00367)
MWA-2-102705	10/27/05	ND (<28.4)	ND (<39.4)	ND (<34.0)	ND (<35.0)	ND (<200)	ND (<19.8)	ND (<21.8)	ND (<31.0)	ND (<17.2)	ND (<48.2)	ND (<30.4)	ND (<0.236)	0.477	0.0965
MWA-2-011306	1/13/06	ND (<0.142)	ND (<0.197)	1.55	ND (<0.175)	ND (<1.00)	ND (<0.0989)	1.70	ND (<0.155)	ND (<0.0859)	1.02	ND (<0.152)	ND (<0.0971)	0.510	ND (<0.0971)
MWA-3-062205	6/22/05	ND (<7.10)	ND (<9.85)	ND (<8.50)	ND (<8.75)	ND (<50.0)	ND (<4.94)	15.0 J	ND (<7.75)	7.00 J	ND (<12.0)	ND (<7.60)	0.318	ND (<0.500)	ND (<0.500)
MWA-3-091505	9/15/05	ND (<1.42)	ND (<1.97)	ND (<1.70)	ND (<1.75)	ND (<10.0)	ND (<0.989)	10.1	ND (<1.55)	3.10 J	ND (<2.41)	ND (<1.52)	1.39	0.418	0.186 J
MWA-3-102605	10/26/05	1.65 J	ND (<0.985)	ND (<0.850)	ND (<0.875)	ND (<5.00)	ND (<0.494)	7.15	ND (<0.775)	2.55	ND (<1.20)	ND (<0.760)	2.11	0.384	0.332
MWA-3-112205	11/22/05	ND (<2.84)	ND (<3.94)	ND (<3.40)	ND (<3.50)	ND (<20.0)	ND (<1.98)	7.40 J	ND (<3.10)	6.00 J	ND (<4.82)	ND (<3.04)	0.715	0.201	0.122
MWA-3-011306	1/13/06	ND (<0.710)	ND (<0.985)	ND (<0.850)	ND (<0.875)	ND (<5.00)	ND (<0.494)	37.6	ND (<0.775)	0.650	4.35	ND (<0.760)	0.659	0.115	ND (<0.962)
MWA-4	7/29/05	ND (<1.42)	ND (<1.97)	ND (<1.70)	ND (1.75)	ND (<10.0)	ND (<0.989)	4.20 J	ND (<1.55)	ND (<0.859)	ND (<2.41)	ND (<1.52)	ND (<0.500)	11.8	ND (<0.500)
MWA-4-102605	10/26/05	1.30 J	ND (<0.985)	ND (<0.850)	ND (<0.875)	8.65 J	ND (<0.494)	2.70	ND (<0.775)	0.900 J	ND (<1.20)	ND (<0.760)	ND (<0.236)	1.29	ND (<0.236)
MWA-4-112205	11/22/05	0.840 J	ND (<0.394)	ND (<0.340)	ND (<0.350)	6.60 J	ND (<0.198)	3.02	ND (<0.310)	0.820 J	ND (<0.482)	ND (<0.304)	0.165	1.47	ND (<0.0952)
MWA-4-011306	1/13/06	ND (<7.10)	ND (<9.85)	ND (<8.50)	ND (<8.75)	ND (<50.0)	ND (<4.94)	8.00 J	ND (<7.75)	ND (<4.30)	ND (<12.0)	ND (<7.60)	ND (<0.238)	3.42	ND (<0.238)
MWA-05	7/28/05	ND (<0.142)	ND (<0.197)	ND (<0.170)	ND (<0.175)	ND (<1.00)	ND (<0.0989)	ND (<0.109)	0.210 J	ND (<0.0859)	ND (<0.241)	ND (<0.152)	1.02	0.236	ND (<0.0500)
MWA-5-102705	10/27/05	ND (<0.142)	0.310 J	ND (<0.170)	ND (<0.175)	ND (<1.00)	1.14 J	ND (<0.109)	0.520	ND (<0.0859)	ND (<0.241)	ND (<0.152)	ND (<0.0472)	ND (<0.0472)	ND (<0.0472)
MWA-5-112105	11/21/05	ND (<0.142)	0.420 J	ND (<0.170)	ND (<0.175)	ND (<1.00)	ND (<0.0989)	ND (<0.109)	0.230 J	ND (<0.0859)	ND (<0.241)	ND (<0.152)	ND (<0.0472)	ND (<0.0472)	ND (<0.0472)
MWA-5-011606	1/16/06	ND (<0.142)	0.270 J	ND (<0.170)	ND (<0.175)	ND (<1.00)	ND (<0.0989)	ND (<0.109)	ND (<0.155)	ND (<0.0859)	ND (<0.241)	ND (<0.152)	ND (<0.0495)	ND (<0.0495)	ND (<0.0495)
MWA-6R	8/1/05	ND (<2.84)	ND (<3.94)	9.00 J	12.4	ND (<20.0)	ND (<1.98)	17.4	ND (<3.10)	ND (<1.72)	14.0	5.20 J	0.0869 J	ND (<0.0500)	ND (<0.0500)
MWA-15R-062205	6/22/05	ND (<142)	ND (<197)	ND (<170)	ND (<175)	ND (<1000)	ND (<98.9)	ND (<109)	ND (<155)	ND (<85.9)	ND (<241)	ND (<152)	193	40.9	9.88
MWA-15R-091605	9/16/05	ND (<284)	ND (<394)	ND (<340)	ND (<350)	ND (<2000)	ND (<198)	ND (<218)	ND (<310)	ND (<172)	ND (<482)	ND (<304)	317	39.3	6.03 J
MWA-18	8/3/05	ND (<0.142)	ND (<0.197)	0.230 J	ND (<0.175)	ND (<1.00)	ND (<0.0989)	1.12	ND (<0.155)	ND (<0.0859)	ND (<0.241)	ND (<0.152)	ND (<0.0500)	ND (<0.0500)	ND (<0.0500)
MWA-19	8/3/05	ND (<0.142)	ND (<0.197)	0.310 J	ND (<0.175)	ND (<1.00)	ND (<0.0989)	13.3	ND (<0.155)	ND (<0.0859)	2.62	ND (<0.152)	0.576	0.114	ND (<0.0500)
MWA-20	8/4/05	ND (<1.42)	ND (<1.97)	ND (1.70)	ND (<1.75)	ND (<10.0)	ND (<0.989)	ND (<1.09)	ND (<1.55)	ND (<0.859)	ND (<2.41)	ND (<1.52)	ND (<0.0500)	ND (<0.0500)	ND (<0.0500)
MWA-22	8/1/05	ND (<7.10)	ND (<9.85)	68.5	ND (<8.75)	ND (<50.0)	ND (<4.94)	ND (<5.45)	ND (<7.75)	ND (<4.30)	ND (<12.0)	ND (<7.60)	1.29	0.115	ND (<0.0500)
MWA-30	8/3/05	ND (<0.142)	ND (<0.197)	ND (<0.170)	ND (<0.175)	ND (<1.00)	0.830 J	ND (<0.109)	0.370 J	ND (<0.0859)	ND (<0.241)	ND (<0.152)	ND (<0.0500)	ND (<0.0500)	ND (<0.0500)
MWA-42	8/2/05	ND (<0.142)	ND (<0.197)	0.260 J	0.250 J	ND (<1.00)	ND (<0.0989)	3.10	0.240 J	ND (<0.0859)	0.860	ND (<0.152)	ND (<0.250)	ND (<0.250)	ND (<0.250)
MWA-44	8/3/05	ND (<0.710)	ND (<0.985)	ND (<0.850)	ND (<0.875)	ND (<5.00)	ND (<0.494)	4.25	ND (<0.775)	ND (<0.430)	ND (<1.20)	ND (<0.760)	0.259	0.202	ND (<0.0500)
MWA-45	8/3/05	ND (<0.142)	ND (<0.197)	0.600	ND (<0.175)	ND (<1.00)	ND (<0.0989)	3.06	0.930	ND (<0.0859)	0.340 J	ND (<0.152)	ND (0.500)	ND (0.500)	ND (0.500)
MWA-46	8/4/05	ND (<0.142)	ND (<0.197)	0.740	ND (<0.175)	ND (<1.00)	ND (<0.0989)	4.52	ND (<0.155)	ND (<0.0859)	0.610	ND (<0.152)	0.611	ND (<0.0500)	ND (<0.0500)
MWA-60	8/2/05	ND (<0.710)	1.30 J	36.9	ND (<0.875)	ND (<5.00)	ND (<0.494)	ND (<0.545)	ND (<0.775)	ND (<0.430)	5.30	ND (<0.760)	0.383	ND (<0.0500)	ND (<0.0500)
MWA-60-102705	10/27/05	ND (<0.710)	ND (<0.985)	29.3	ND (<0.875)	ND (<5.00)	ND (<0.494)	ND (<0.545)	ND (<0.775)	ND (<0.430)	6.55	ND (<0.760)	ND (<0.0472)	ND (<0.0472)	ND (<0.0472)
MWA-60-112105	11/21/05	ND (<0.142)	ND (<0.197)	2.65	0.300 J	ND (<1.00)	ND (<0.0989)	0.460 J	ND (<0.155)	0.800	3.05	ND (<0.152)	ND (<0.0472)	ND (<0.0472)	ND (<0.0472)

Table 1

Groundwater Organic Analytical Results
 Persulfate Oxidation Interim Remedial Measure
 Arkema, Inc. Facility
 Portland, Oregon

Sample Number	Date	Acetone (µg/L)	Benzene (µg/L)	Bromo-chloro-methane (µg/L)	Bromo-dichloro-methane (µg/L)	Carbon disulfide (µg/L)	Carbon tetrachloride (µg/L)	Chlorobenzene (µg/L)	Chloroethane (µg/L)	Chloroform (µg/L)	Chloromethane (µg/L)	Dibromo-chloro-methane (µg/L)	Dibromo-methane (µg/L)	1,2-Dichlorobenzene (µg/L)	1,4-Dichlorobenzene (µg/L)	1,1-Dichloroethane (µg/L)
PMP-5-062205	6/22/05	ND (<2.34)	ND (<0.147)	ND (<0.266)	ND (<0.183)	ND (<0.233)	ND (<0.140)	ND (<0.136)	4.32	158	ND (<0.159)	ND (<0.133)	ND (<0.117)	ND (<0.0859)	ND (<0.187)	ND (<0.157)
PMP-5-091505	9/15/05	ND (<23.4)	ND (<1.47)	ND (<2.66)	ND (<1.83)	ND (<2.33)	ND (<1.40)	1010	11.7	188	ND (<1.59)	ND (<1.33)	ND (<1.17)	ND (<0.0859)	ND (<1.87)	ND (<1.57)
PMP-5-102705	10/27/05	ND (<234)	ND (<14.7)	ND (<26.6)	ND (<18.3)	ND (<23.3)	ND (<14.0)	16900	ND (<32.7)	313	ND (<15.9)	ND (<13.3)	ND (<11.7)	ND (<8.59)	ND (<18.7)	ND (<15.7)
PMP-5-112205	11/22/05	490 J	ND (<29.4)	ND (<53.2)	ND (<36.6)	ND (<46.6)	ND (<28.8)	29000	ND (<65.4)	420	ND (<31.8)	ND (<26.6)	ND (<23.4)	ND (<17.2)	ND (<37.4)	ND (<31.4)
PMP-6-062205	6/22/05	ND (<2.34)	ND (<0.147)	ND (<0.266)	ND (<0.183)	ND (<0.233)	ND (<0.140)	17.4	1.31	13	ND (<0.159)	ND (<0.133)	ND (<0.117)	ND (<0.0859)	ND (<0.187)	ND (<0.157)
PMP-6-091405	9/14/05	ND (<468)	ND (<29.4)	ND (<53.2)	ND (<36.6)	ND (<46.6)	ND (<28.0)	17100	ND (<65.4)	106	ND (<31.8)	ND (<26.6)	ND (<23.4)	ND (<17.2)	ND (<37.4)	ND (<31.4)
PMP-6-102705	10/27/05	ND (<468)	ND (<29.4)	ND (<53.2)	ND (<36.6)	ND (<46.6)	ND (<28.0)	18600	ND (<65.4)	118	ND (<31.8)	ND (<26.6)	ND (<23.4)	ND (<17.2)	ND (<37.4)	ND (<31.4)
PMP-6-112205	11/22/05	292 J	ND (<7.35)	ND (<13.3)	ND (<9.15)	ND (<11.6)	ND (<7.00)	8580	18.5 J	66	ND (<7.95)	ND (<6.65)	ND (<5.85)	ND (<4.30)	ND (<9.35)	ND (<7.85)
<i>Shallow Intermediate Zone</i>																
MWA-17si	7/29/05	2460 J	ND (<73.5)	ND (<166)	ND (<133)	ND (<116)	ND (<70.0)	58900	ND (<164)	560	ND (<79.5)	ND (<66.5)	ND (<58.5)	ND (<43.0)	ND (<93.5)	ND (<78.5)
MWA-17si-102605	10/26/05	382 J	ND (<14.7)	ND (<26.6)	ND (<18.3)	ND (<23.3)	ND (<14.0)	13300	74.0	588	365	ND (<13.3)	ND (<11.7)	ND (<8.59)	ND (<18.7)	ND (<15.7)
MWA-17si-112105	11/21/05	ND (<468)	ND (<29.4)	ND (<53.2)	ND (<36.6)	ND (<46.6)	ND (<28.0)	27700	72.0 J	544	560	ND (<26.6)	ND (23.4)	ND (<17.2)	40.0 J	ND (<31.4)
MWA-17si-011306	1/13/06	ND (<2340)	ND (<147)	ND (<266)	ND (<183)	ND (<233)	ND (<140)	121000	ND (<327)	760	ND (<159)	ND (<133)	ND (<117)	ND (<85.9)	ND (<187)	ND (<157)
MWA-67si	8/1/05	ND (<4680)	ND (<294)	ND (<532)	ND (<366)	ND (<466)	1740	216000	ND (<654)	2180	ND (<318)	ND (<266)	ND (<234)	ND (<172)	ND (<374)	ND (<314)
MWA-67si-102705	10/27/05	ND (<4680)	ND (<294)	ND (<532)	ND (<366)	ND (<466)	540 J	198000	ND (<654)	2400	ND (<318)	ND (<266)	ND (<234)	ND (<172)	ND (<374)	ND (<314)
MWA-67si-112105	11/21/05	ND (<4680)	ND (<294)	ND (<532)	ND (<366)	ND (<466)	820 J	191000	ND (<654)	2160	ND (<318)	ND (<266)	ND (<234)	ND (<172)	ND (<374)	ND (<314)
MWA-67si-011306	1/13/06	ND (<4680)	ND (<294)	ND (<532)	ND (<366)	ND (<466)	1720	201000	ND (<654)	2040	ND (<318)	ND (<266)	ND (<234)	ND (<172)	ND (<374)	ND (<314)
MWA-68si	8/2/05	ND (<468)	ND (<29.4)	ND (<53.2)	ND (<36.6)	ND (<46.6)	ND (<28.0)	21000	494	146	ND (<31.8)	ND (<26.6)	ND (<23.4)	20.0 J	54.0 J	ND (<31.4)
MWA-68si-102505	10/25/05	ND (<117)	ND (<7.35)	ND (<13.3)	ND (<9.15)	ND (<11.6)	ND (<7.00)	6300	376	112	196	ND (<6.65)	ND (<5.85)	13.0 J	31.5	ND (<7.85)
MWA-68si-112205	11/22/05	190 J	ND (<7.35)	ND (<13.3)	ND (<9.15)	ND (<11.6)	ND (<7.00)	6250	474	113	479	ND (<6.65)	ND (<5.85)	9.00 J	25.5	ND (<7.85)
MWA-68si-011306	1/13/06	ND (<234)	ND (<14.7)	ND (<26.6)	ND (<18.3)	ND (<23.3)	ND (<14.0)	15400	478	129	156 J	ND (<13.3)	ND (<11.7)	13.0 J	ND (<18.7)	ND (<15.7)
<i>Intermediate Zone</i>																
MWA - 8i-062105	6/21/05	16.0 J	0.220 J	ND (<0.266)	ND (<0.183)	ND (<0.233)	ND (<0.140)	26.6	ND (<0.327)	ND (<0.143)	ND (<0.159)	ND (<0.133)	ND (<0.117)	0.240 J	ND (<0.187)	0.660
MWA-8i-102705	10/27/05	ND (<4.68)	0.480 J	ND (<0.532)	ND (<0.366)	ND (<0.466)	ND (<0.280)	215	ND (<0.654)	ND (<0.286)	ND (<0.318)	ND (<0.266)	ND (<0.234)	0.300 J	ND (<0.374)	0.800 J
MWA-8i-091505	9/15/05	ND (<2.34)	0.660	ND (<0.266)	ND (<0.183)	ND (<0.233)	ND (<0.140)	122	ND (<0.327)	ND (<0.143)	ND (<0.159)	ND (<0.133)	ND (<0.117)	0.360 J	ND (<0.187)	0.820
MWA-8i-112105	11/21/05	ND (<2.34)	0.330 J	ND (<0.266)	ND (<0.183)	ND (<0.233)	ND (<0.140)	46.3	ND (<0.327)	ND (<0.143)	ND (<0.159)	ND (<0.133)	ND (<0.117)	0.270 J	ND (<0.187)	0.880
MWA-9i-062205	6/22/05	ND (<1170)	ND (<73.5)	ND (<133)	ND (<91.5)	ND (<116)	ND (<70.0)	65700	ND (<164)	ND (<71.5)	ND (<79.5)	ND (<66.5)	ND (<58.5)	ND (<43.0)	ND (<93.5)	ND (<78.5)
MWA-9i-091505	9/15/05	ND (<468)	ND (<29.4)	ND (<53.2)	ND (<36.6)	ND (<46.6)	ND (<28.0)	30,500	ND (<65.4)	ND (<28.6)	ND (<31.8)	ND (<26.6)	ND (<23.4)	ND (<17.2)	ND (<37.4)	ND (<31.4)
MWA-9i-102605	10/26/05	514 J	ND (<29.4)	ND (<53.2)	ND (<36.6)	ND (<46.6)	ND (<28.0)	35600	ND (<65.4)	52.0 J	ND (<31.8)	ND (<26.6)	ND (<23.4)	ND (<17.2)	ND (<37.4)	ND (<31.4)
MWA-9i-112205	11/22/05	1260 J	ND (<29.4)	ND (<53.2)	ND (<36.6)	ND (<46.6)	ND (<28.0)	33700	ND (<65.4)	38.0 J	ND (<31.8)	ND (<26.6)	ND (<23.4)	ND (<17.2)	ND (<37.4)	ND (<31.4)
MWA-10i	7/29/05	ND (<234)	ND (<14.7)	ND (<33.3)	ND (<26.6)	ND (<23.3)	ND (<14.0)	12400	ND (<32.7)	ND (<14.3)	ND (<15.9)	ND (<13.3)	ND (<11.7)	ND (<8.59)	ND	

Table 1

Groundwater Organic Analytical Results
 Persulfate Oxidation Interim Remedial Measure
 Arkema, Inc. Facility
 Portland, Oregon

Sample Number	Date	1,2-Dichloroethane ($\mu\text{g/L}$)	1,1-Dichloroethene ($\mu\text{g/L}$)	cis-1,2-Dichlorethane ($\mu\text{g/L}$)	trans-1,2-Dichloroethene ($\mu\text{g/L}$)	Methylene chloride ($\mu\text{g/L}$)	Naphthalene ($\mu\text{g/L}$)	Tetrachlorethene ($\mu\text{g/L}$)	Toluene ($\mu\text{g/L}$)	1,1,1-Trichloroethane ($\mu\text{g/L}$)	Trichloroethene ($\mu\text{g/L}$)	Vinyl chloride ($\mu\text{g/L}$)	DDT ($\mu\text{g/L}$)	DDD ($\mu\text{g/L}$)	DDE ($\mu\text{g/L}$)
PMP-5-062205	6/22/05	2.63	ND (<0.197)	ND (<0.170)	ND (<0.175)	ND (<1.00)	ND (<0.0989)	4.77	ND (<0.155)	0.370 J	ND (<0.241)	ND (<0.152)	39.6	2.26	ND (<5.00)
PMP-5-091505	9/15/05	5.40	ND (<1.97)	ND (<1.70)	ND (<1.75)	ND (<10.0)	ND (<0.989)	8.70	ND (<1.55)	ND (<0.859)	ND (<2.41)	ND (<1.52)	53.5	4.01	0.891 J
PMP-5-102705	10/27/05	ND (<14.2)	ND (<19.7)	ND (<17.0)	ND (<17.5)	ND (<100)	ND (<9.89)	17.0 J	ND (<15.5)	ND (<8.59)	ND (<24.1)	ND (<15.2)	100	5.47	1.70
PMP-5-112205	11/22/05	ND (<28.4)	ND (<39.4)	ND (<34.0)	ND (<35.0)	ND (<200)	ND (<19.8)	ND (<21.8)	ND (<31.0)	ND (<17.2)	ND (<48.2)	ND (<30.4)	72.9	5.26	1.36
PMP-6-062205	6/22/05	0.320	ND (<0.197)	ND (<0.170)	ND (<0.175)	ND (<1.00)	ND (<0.0989)	0.410	ND (<0.155)	0.410	ND (<0.241)	ND (<0.152)	5.56	0.862	ND (<0.500)
PMP-6-091405	9/14/05	ND (<28.4)	ND (<39.4)	ND (<34.0)	ND (<35.0)	ND (<200)	ND (<19.8)	ND (<21.8)	ND (<31.0)	ND (<17.2)	ND (<48.2)	ND (<30.4)	6.2	0.789 J	ND (<0.184)
PMP-6-102705	10/27/05	ND (<28.4)	ND (<39.4)	ND (<34.0)	ND (<35.0)	ND (<200)	ND (<19.8)	ND (<21.8)	ND (<31.0)	ND (<17.2)	ND (<48.2)	ND (<30.4)	8.84	1.07	0.256
PMP-6-112205	11/22/05	ND (<7.10)	ND (<9.85)	ND (<8.50)	ND (<8.75)	ND (<50.0)	ND (<4.94)	ND (<5.45)	ND (<7.75)	7.50 J	ND (<12.0)	ND (<7.60)	3.44	0.549	0.145
Shallow Intermediate Zone															
MWA-17si	7/29/05	ND (<71.0)	ND (<98.5)	ND (<85.0)	ND (<87.5)	ND (<500)	ND (<49.4)	65.0 J	ND (<77.5)	ND (<43.0)	ND (<120)	ND (<76.0)	ND (<5.00)	9.33	ND (<5.00)
MWA-17si-102605	10/26/05	19.0 J	ND (<19.7)	ND (<17.0)	ND (<17.5)	ND (<100)	ND (<9.89)	17.0 J	ND (<15.5)	ND (<8.59)	ND (<24.1)	ND (<15.2)	ND (<0.236)	0.344	0.123
MWA-17si-112105	11/21/05	ND (<28.4)	ND (<39.4)	ND (<34.0)	ND (<35.0)	ND (<200)	ND (<19.8)	34.0 J	ND (<31.0)	ND (<17.2)	ND (<48.2)	ND (<30.4)	0.0682 J	0.525	0.218
MWA-17si-011306	1/13/06	ND (<142)	ND (<197)	ND (<170)	ND (<175)	ND (<1000)	ND (<98.9)	ND (<109)	200	ND (<85.9)	ND (<241)	ND (<152)	ND (<0.243)	0.851	ND (<0.243)
MWA-67si	8/1/05	ND (<284)	ND (<394)	ND (<340)	ND (<350)	ND (<2000)	ND (<198)	3460	ND (<310)	ND (<172)	ND (<482)	ND (<304)	ND (<5.00)	ND (<5.00)	ND (<5.00)
MWA-67si-102705	10/27/05	ND (<284)	ND (<394)	ND (<340)	ND (<350)	ND (<2000)	ND (<198)	1700	ND (<310)	ND (<172)	ND (<482)	ND (<304)	0.365	ND (<0.236)	ND (<0.236)
MWA-67si-112105	11/21/05	ND (<284)	ND (<394)	ND (<340)	ND (<350)	ND (<2000)	ND (<198)	1760	ND (<310)	ND (<172)	ND (<482)	ND (<304)	0.130	ND (<0.0472)	0.0593 J
MWA-67si-011306	1/13/06	ND (<284)	ND (<394)	ND (<340)	ND (<350)	ND (<2000)	ND (<198)	2380	ND (<310)	ND (<172)	ND (<482)	ND (<304)	ND (<0.238)	ND (<0.238)	ND (<0.238)
MWA-68si	8/2/05	ND (<28.4)	ND (<39.4)	ND (<34.0)	ND (<35.0)	ND (<200)	ND (<19.8)	28.0 J	ND (<31.0)	ND (<17.2)	ND (<48.2)	ND (<30.4)	24.8	ND (<5.00)	ND (<5.00)
MWA-68si-102505	10/25/05	ND (<7.10)	ND (<9.85)	ND (<8.50)	ND (<8.75)	ND (<50.0)	ND (<4.94)	10.0 J	ND (<7.75)	ND (<4.30)	ND (<12.0)	ND (<7.60)	ND (<0.476)	ND (<0.476)	ND (<0.476)
MWA-68si-112205	11/22/05	ND (<7.10)	ND (<9.85)	ND (<8.50)	ND (<8.75)	ND (<50.0)	ND (<4.94)	10.5 J	ND (<7.75)	ND (<4.30)	ND (<12.0)	ND (<7.60)	ND (<0.238)	ND (<0.238)	0.529
MWA-68si-011306	1/13/06	ND (<14.2)	ND (<19.7)	ND (<17.0)	ND (<17.5)	ND (<100)	ND (<9.89)	19.0 J	ND (<15.5)	ND (<8.59)	ND (<24.1)	ND (<15.2)	0.526	ND (<0.721)	ND (<0.240)
Intermediate Zone															
MWA - 8i-062105	6/21/05	ND (<0.142)	ND (<0.197)	0.170 J	ND (<0.175)	ND (<1.00)	ND (<0.0989)	ND (<0.109)	ND (<0.155)	ND (<0.0859)	ND (<0.241)	ND (<0.152)	ND (<0.0500)	ND (<0.0500)	ND (<0.0500)
MWA-8i-102705	10/27/05	ND (<0.284)	ND (<0.394)	1.32	ND (<0.350)	ND (<2.00)	ND (<0.198)	ND (<0.218)	0.580 J	ND (<0.172)	ND (<0.482)	ND (<0.304)	ND (<0.0472)	ND (<0.0472)	ND (<0.0472)
MWA-8i-091505	9/15/05	ND (<0.142)	ND (<0.197)	1.37	ND (<0.175)	ND (<1.00)	0.360 J	ND (<0.109)	1.91	ND (<0.0859)	ND (<0.241)	ND (<0.152)	0.0243 J	ND (<0.00103)	ND (<0.00367)
MWA-8i-112105	11/21/05	ND (<0.142)	ND (<0.197)	0.220 J	ND (<0.175)	ND (<1.00)	0.290 J	ND (<0.109)	ND (<0.155)	ND (<0.0859)	ND (<0.241)	ND (<0.152)	0.0678 J	ND (<0.0472)	ND (<0.0472)
MWA-9i-062205	6/22/05	ND (<71.0)	ND (<98.5)	ND (<85.0)	ND (<87.5)	ND (<500)	ND (<49.4)	ND (<54.5)	ND (<7.75)	ND (<43.0)	ND (<120)	ND (<76.0)	ND (<0.500)	1.04	ND (<0.500)
MWA-9i-091505	9/15/05	ND (<28.4)	ND (<39.4)	ND (<34.0)	ND (<35.0)	ND (<200)	ND (<19.8)	ND (<21.8)	ND (<31.0)	ND (<17.2)	ND (<48.2)	ND (<30.4)	ND (<0.0370)	0.625	ND (<0.0184)
MWA-9i-102605	10/26/05	ND (<28.4)	ND (<39.4)	ND (<34.0)	ND (<35.0)	ND (<200)	ND (<19.8)	ND (<21.8)	ND (<31.0)	ND (<17.2)	ND (<48.2)	ND (<30.4)	ND (<0.236)	0.940	ND (<0.236)
MWA-9i-112205	11/22/05	ND (<28.4)	ND (<39.4)	ND (<34.0)	ND (<35.0)	ND (<200)	ND (<19.8)	ND (<21.8)	ND (<31.0)	ND (<17.2)	ND (<48.2)	ND (<30.4)	ND (<0.0476)	1.30	0.0573 J
MWA-10i	7/29/05	ND (<14.2)	ND (<19.7)	ND (<17.0)	ND (<17.5)	ND (<100)	ND (<9.89)	ND (<10.9)	ND (<15.5)	ND (<8.59)	ND (<24.1)	ND (<15.2)	0.504	ND (<0.100)	ND (<0.100)
MWA-10i-102605	10/26/05	ND (<14.2)	ND (<19.7)	ND (<17.0)	ND (<17.5)	ND (<100)	ND (<9.89)	ND (<10.9)	ND (<15.5)	ND (<8.59)	ND (<24.1)	ND			

Table 2

Groundwater Inorganic Analytical Results
 Persulfate Oxidation Interim Remedial Measure
 Arkema, Inc. Facility
 Portland, Oregon

Well Number	Sample Number	Date	Antimony (mg/L)	Arsenic (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Zinc (mg/L)	Sulfate (mg/L)	
Shallow Zone																	
MWA-2	MWA-02	7/28/05	ND (<0.00004)	0.000600 J	0.000760 J	ND (<0.0001)	0.576	0.00904	0.000240 J	ND (<0.00005)	0.831	0.000630 J	ND (<0.00008)	ND (<0.00008)	0.0836	649	
	MWA-2-102705	10/27/05	ND (<0.000192)	0.00197	0.00113	ND (<0.000138)	0.612	0.00818	0.000252 J	ND (<0.0000630)	0.797	0.00174	J	ND (<0.0000566)	ND (<0.0000307)	0.128	664
	MWA-2-011306	1/13/06	ND (<0.00102)	ND(<0.00664)	ND (<0.00128)	ND (<0.000714)	ND(<0.00121)	0.00280 J	ND (<0.000553)	ND (<0.0000630)	ND (<0.00180)	ND (<0.00284)	ND (<0.00121)	ND (<0.000181)	ND (<0.00469)	53.2	
MWA-3	MWA-03	7/28/05	0.000830 J	0.000190 J	ND (<0.00110)	0.000160 J	0.226	0.00908	0.00372	ND (<0.00005)	1.51	0.000990 J	J	ND (<0.00008)	ND (<0.00008)	0.105	1030
	MWA-3-102605	10/26/05	0.000500 J	0.000850 J	0.00127	0.00138	0.592	0.679	0.500	ND (<0.0000630)	0.433	0.00475	0.00137	0.000160 J	1.41	2610	
	MWA-3-112205	11/22/05	0.000200 J	0.00181	0.00359	0.00458	0.709	0.926	0.754	ND (<0.0000630)	0.642	0.00150 J	0.00161	0.000230 J	2.37	3440	
MWA-4	MWA-3-011306	1/13/06	0.00410 J	ND(<0.00664)	ND (<0.00128)	ND (<0.000714)	0.0603	0.0636	0.00548 J	ND (<0.0000630)	0.0375	ND (<0.00284)	ND (<0.00121)	ND (<0.000181)	0.558	510	
	MWA-04	7/29/05	0.00110 J	0.00103	ND (<0.00007)	0.000210 J	0.000340 J	0.00167	0.000520 J	ND (<0.00005)	0.0117	0.00157	ND (<0.00170)	ND (<0.00100)	0.00874 J	459	
	MWA-4-102605	10/26/05	0.000650 J	0.000860 J	0.000470 J	0.00276	0.00406	0.0963	0.00522	ND (<0.0000630)	0.191	0.00526	ND (<0.0000566)	0.000160 J	0.140	2390	
MWA-5	MWA-4-112205	11/22/05	0.000490 J	ND(<0.00664)	0.000470 J	0.00156	0.00330	0.0528	0.0117	ND (<0.0000630)	0.110	0.000950 J	J	ND (<0.000121)	0.000170 J	0.108	2010
	MWA-4-011306	1/13/06	0.00125 J	ND(<0.00664)	ND (<0.00128)	ND (<0.000714)	0.00415 J	0.0130 J	0.00343 J	ND (<0.0000630)	0.0557	ND (<0.00284)	ND (<0.00121)	0.000190 J	0.0518	1760	
	MWA-05	7/28/05	ND (<0.00004)	0.00372	ND (<0.000110)	ND (<0.0001)	0.00563	0.00135	0.000840 J	J	ND (<0.00005)	0.00425	ND (<0.000320)	ND (<0.00008)	ND (<0.00001)	0.160 J	
MWA-5	MWA-5-102705	10/27/05	0.000240 J	0.0101	ND(<0.000377)	ND (<0.000138)	0.0149	0.0280	0.00833	ND (<0.0000630)	0.00647	0.00167 J	J	0.000131 J	ND (<0.0000181)	0.00463 J	ND (<0.0419)
	MWA-5-112105	11/21/05	0.000132 J	0.00639	ND (<0.000128)	ND (<0.0000714)	0.00878	0.00570	0.00215	ND (<0.0000630)	0.00397	0.000565 J	J	ND (0.000121)	ND (<0.0000181)	0.00433 J	ND (<0.0838)
	MWA-5-011606	1/16/06	ND (<0.00102)	ND(<0.00664)	ND (<0.00128)	ND (<0.000714)	0.00629 J	0.0126 J	0.00111 J	ND (<0.0000630)	ND (<0.00180)	ND (<0.00284)	ND (<0.00121)	ND (<0.000181)	ND (<0.00469)	0.390	
MWA-6R	MWA-6-R	8/1/05	ND (<0.0002)	0.00290 J	ND (<0.000110)	ND (<0.0001)	0.00555	0.00842	0.000490 J	J	ND (<0.00005)	0.0303	ND (<0.00160)	ND (<0.00008)	0.000190 J	0.00187 J	126
MWA-15R	MWA-15R	8/1/05	ND (<0.0002)	0.0146	ND (<0.000110)	ND (<0.0001)	0.00871	0.00509	0.000810 J	J	ND (<0.00005)	0.0232	0.00135	ND (<0.00008)	ND (<0.00008)	0.000335 J	752
MWA-18	MWA-18	8/3/05	ND (<0.000200)	0.00230 J	ND (<0.000550)	ND (<0.000500)	0.0400	0.0147	0.000360 J	J	ND (<0.00005)	0.268	ND (<0.00160)	ND (<0.000400)	ND (<0.00008)	0.00357 J	26.7
MWA-19	MWA-19	8/3/05	0.000250 J	0.00740	ND (<0.000550)	ND (<0.000500)	0.0235	0.107	0.00116	0.000769	0.129	0.00170	ND (<0.000400)	0.000180 J	0.00351 J	89.3	
MWA-20	MWA-20	8/3/05	0.000350 J	0.242	ND (<0.000550)	ND (<0.000500)	0.0114	0.0121	0.000820 J	J	ND (<0.00005)	0.0843	ND (0.00160)	ND (<0.000400)	ND (<0.00008)	0.00270 J	36.8
MWA-22	MWA-22	8/1/05	0.000650 J	0.522	0.000190 J	ND (<0.0001)	0.0434	0.0223	0.000705	0.150	ND (<0.00160)	ND (<0.00008)	ND (<0.00008)	0.00739 J	674		
MWA-30	MWA-30	8/3/05	0.00170 J	0.0210 J	ND (<0.0110)	ND (<0.0100)	0.583	0.0220 J	0.0472	ND (<0.00005)	0.0527	ND (<0.0320)	ND (<0.00800)	0.000160 J	0.0552	785	
MWA-42	MWA-42	8/2/05	ND (<0.000200)	0.101	ND (<0.000110)	ND (<0.0001)	0.00409	0.00100	0.000810 J	J	ND (<0.00005)	0.0191	0.000780 J	J	ND (<0.00008)	0.00356 J	232
MWA-44	MWA-44	8/3/05	0.000900 J	0.155	ND (<0.00550)	0.00500 J	0.0220 J	0.00149	0.000808 J	J	0.0224	ND (<0.0160)	ND (<0.00400)	ND (<0.00008)	0.00190 J	260	
MWA-45	MWA-45	8/3/05	0.000550 J	0.0828	ND (<0.000550)	ND (<0.000500)	0.0359	0.0206	0.000630 J	J	0.00115 J	0.0146	ND (<0.00160)	ND (<0.000400)	ND (<0.00008)	0.00629 J	227
MWA-46	MWA-46	8/4/05	0.000500 J	0.0350	ND (<0.000550)	0.000500 J	0.0248	0.394	0.00349	0.00182	0.101	ND (<0.00160)	ND (<0.000400)	ND (<0.00008)	0.00693 J	47.9	
MWA-60	MWA-60	8/2/05	ND (<0.0002)	0.00512	ND (<0.000110)	ND (<0.0001)	0.00305	0.00106	0.000580 J	J	ND (<0.00005)	0.00487	ND (<0.000320)	ND (<0.00008)	ND (<0.00008)	0.00431 J	91.8
	MWA-60-102705	10/27/05	0.000330 J	0.00729	ND (<0.000377)	ND (<0.000138)	0.00144	0.00456	ND (<0.000224)	ND (<0.0000630)	0.00555	ND (<0.000876)	ND (<0.0000566)	0.000400 J	0.00497 J	874	
	MWA-60-112105	11/21/05	0.000128 J	0.00266	ND (<0.000128)	ND (<0.0000714)	0.00384	0.00349	0.000493 J	ND (<0.0000630)	0.00835	0.00101 J	ND (<0.000121)	0.000106 J	0.0126	1310	
MWA-61	MWA-61	8/1/05	ND (<0.0002)	0.00134	0.000260 J	0.000350 J	0.00620 J	0.00317	ND (<0.00008)	ND (<0.00005)	0.0411	0.00210	ND (<0.00008)	ND (<0.00008)	0.0531	1620	
	MWA-61-102605	10/26/05	ND (<0.000192)	0.000650 J	0.00345	0.											

Table 2

Groundwater Inorganic Analytical Results
 Persulfate Oxidation Interim Remedial Measure
 Arkema, Inc. Facility
 Portland, Oregon

Well Number	Sample Number	Date	Antimony (mg/L)	Arsenic (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Zinc (mg/L)	Sulfate (mg/L)
MWA-68si	MWA-68si	8/2/05	ND(<0.0002)	0.0141	ND (<0.000110)	ND (<0.000100)	0.00142	0.00159	0.000800 J	ND (<0.00005)	0.0214	0.00291	ND (<0.00008)	ND (<0.00008)	0.0811	3360
	MWA-68si-102505	10/25/05	0.000300 J	0.0242	0.00963	0.00886	0.128	1.06	0.0638	0.0000948 J	0.145	0.0128	ND (<0.0000566)	ND (<0.000724)	0.692	5950
	MWA-68si-112205	11/22/05	0.000200 J	0.0254	0.0110	0.00585	0.172	0.957	0.00324	ND (<0.0000630)	0.150	0.00186 J	ND (<0.000121)	0.000110 J	0.573	6310
	MWA-68si-011306	1/13/06	ND (<0.00102)	0.0190	0.00309 J	0.00126 J	0.0370	0.309	0.000923 J	0.000190 J	0.0684	ND (<0.00284)	ND (<0.00121)	0.000428 J	0.354	4630
<i>Intermediate Zone</i>																
MWA-8i	MWA-08i	7/28/05	ND (<0.00004)	0.0355	0.00121	ND (<0.0001)	0.0162	0.00243	0.00363	ND (<0.00005)	0.0754	ND (<0.000320)	ND (<0.00008)	ND (<0.00008)	0.00848 J	69.3
	MWA-8i-102705	10/27/05	0.000740 J	0.0947	0.00170	ND (<0.000138)	0.150	0.0722	0.0124	0.000157 J	0.199	0.00195 J	0.000411 J	0.0000900 J	0.0109	75.0
	MWA-8i-112105	11/21/05	0.000438 J	0.0626	0.00105 J	0.000156 J	0.0594	0.0362	0.00692	0.0000836 J	0.0608	0.00141 J	0.000251 J	0.0000403 J	0.00879	77.5
MWA-9i	MWA-09i	7/29/05	0.000900 J	0.0360 J	0.000160 J	ND (<0.000140)	0.401	0.00232	0.000460 J	ND (<0.00005)	5.98	ND (<0.00290)	ND (<0.000170)	ND (<0.00100)	0.00925 J	866
	MWA-9i-102605	10/26/05	0.000510 J	0.0746	0.000540 J	ND (<0.000138)	0.575	0.0276	0.00153	0.0000737 J	1.88	ND (<0.000876)	0.000151 J	0.0000400 J	0.0197	653
	MWA-9i-112205	11/22/05	ND (<0.000512)	0.0234	ND (<0.000640)	ND (<0.000357)	0.0866	0.0122	0.00105 J	0.000126 J	2.64	ND (<0.00142)	ND (<0.000606)	0.000100 J	0.0101 J	630
MWA-10i	MWA-10i	7/29/05	ND (<0.0009)	0.0125	ND (<0.00007)	ND (<0.000140)	0.00233	0.00146	0.000300 J	ND (<0.00005)	0.0257	ND (<0.00290)	ND (<0.000170)	ND (<0.00100)	ND (<0.00313)	231
	MWA-10i-102605	10/26/05	0.000640 J	0.00184	ND (<0.000377)	ND (<0.000138)	0.0305	0.00422	ND (<0.000224)	ND (<0.0000630)	0.947	0.00105 J	ND (<0.0000566)	0.0000800 J	0.00461 J	448
	MWA-10i-112205	11/22/05	0.000180 J	0.0147	ND (<0.000128)	ND (<0.0000714)	0.0108	0.00165 J	0.000450 J	ND (<0.0000630)	0.0155	ND (<0.000284)	ND (<0.000121)	0.0000300 J	0.00205	383
MWA-11i	MWA-11	8/1/05	ND (<0.0002)	0.362	ND (<0.000110)	ND (<0.0001)	0.000330 J	0.00130	0.000240 J	ND (<0.00005)	0.0144	0.000910 J	ND (<0.00008)	ND (<0.00008)	0.00366 J	7.06
MWA-14i	MWA-14i	7/28/05	ND (<0.00004)	0.359	ND (<0.000110)	ND (<0.0001)	0.142	0.00278	0.000290 J	ND (<0.00005)	0.119	ND (<0.000320)	ND (<0.00008)	ND (<0.00008)	ND (<0.0001)	92.8
	MWA-14i-102705	10/27/05	ND (<0.000192)	0.0597	ND (<0.000377)	ND (<0.000138)	0.00593	0.00280	0.000279 J	ND (<0.0000630)	0.112	0.00170 J	ND (<0.0000566)	ND (<0.0000181)	0.00608	71.2
	MWA-14i-112105	11/21/05	0.000108 J	0.0350	ND (<0.000128)	ND (<0.0000714)	0.00210	0.000849 J	0.000512 J	ND (<0.0000630)	0.0258	0.000402 J	ND (<0.000121)	0.0000206 J	0.00457 J	92.9
MWA-16i	MWA-16i	8/2/05	0.000350 J	0.00670	0.000450 J	0.000710 J	0.0107	0.0303	0.00188	0.000106 J	0.261	0.00210 J	ND (<0.00008)	0.000110 J	0.00724 J	204
MWA-32i	MWA-32i	8/3/05	0.000900 J	0.00700 J	ND (<0.00550)	ND (<0.00500)	0.148	0.0355 J	0.00140	ND (<0.00005)	0.0192	ND (<0.0160)	ND (<0.00400)	0.000130 J	0.00805 J	448
MWA-34i	MWA-34i	8/3/05	0.00115 J	0.425	ND (<0.000550)	ND (<0.000500)	0.0424	0.00675	0.000640 J	ND (<0.00005)	0.0355	ND (<0.00160)	ND (<0.000400)	ND (<0.00008)	0.00139 J	358
MWA-49i	MWA-49i	8/3/05	ND (<0.000200)	ND (<0.00450)	ND (<0.00550)	ND (<0.00500)	0.122	0.0485 J	0.000420 J	ND (<0.00005)	0.0307	ND (<0.0160)	ND (<0.00400)	0.0000800 J	0.0107	193
MWA-51i	MWA-51i	8/3/05	0.000550 J	0.962	ND (<0.00550)	0.00500 J	0.100	0.104	0.00183	0.00148	0.187	ND (<0.0160)	ND (<0.00400)	0.000580 J	0.00868 J	237
MWA-55i	MWA-55i	8/3/05	0.000950 J	0.0958	ND (<0.000550)	ND (<0.000500)	0.137	0.0224	0.000610 J	0.0000979 J	0.0107	ND (<0.00160)	ND (<0.000400)	ND (<0.00008)	0.000980 J	142
MWA-64i	MWA-64i	8/1/05	ND (<0.0002)	0.0726	0.000270 J	ND (<0.0001)	0.0103	0.000730 J	0.00160	ND (<0.00005)	0.0239	ND (<0.00160)	ND (<0.00008)	ND (<0.00008)	0.0108	174
MWA-65i	MWA-65i	8/2/05	ND (<0.0002)	0.00116 J	ND (<0.000110)	0.000140 J	0.0297	0.00119	0.000940 J	ND (<0.00005)	0.00732	0.000780 J	ND (<0.00008)	ND (<0.00008)	0.00719 J	313
MWA-66i	MWA-66i	8/2/05	ND (<0.0002)	0.000810 J	0.000310 J	0.00117	0.00131	0.00191	0.00100	ND (<0.00005)	0.0416	ND (<0.000320)	ND (<0.00008)	ND (<0.00008)	0.108	915

Table 3

*Field Parameters Measured in Groundwater
Persulfate Oxidation Interim Remedial Measure
Arkema, Inc. Facility
Portland, Oregon*

Well Number	Sample Number	Date	pH	Temp. (deg. C)	EC (mS/cm)	ORP (mV)	DO (mg O ₂ /L)	Turbidity (NTU)	Field Sulfate (mg/L)
<i>Shallow Zone</i>									
MWA-2	MWA-02-072805	7/28/05	5.33	18.38	3.52	119.2	1.80	7.6	NA
	MWA-02-091505	9/15/05	4.73	16.57	5.04	210.4	4.00	2.9	NA
	MWA-02-101305	10/13/05	5.03	15.98	4.64	151.9	NM ¹	13.3	OR >200
	MWA-02-102705	10/27/05	4.86	15.80	5.01	113.8	1.07	0.9	OR >200
	MWA-02-011306	1/13/06	6.39	14.50	0.339	15.9	10.78	12.3	
MWA-3	MWA-03-072805	7/28/05	6.07	20.54	3.117	48.4	2.38	22.0	NA
	MWA-03-091505	9/15/05	6.29	17.13	2.256	92.0	3.38	218.0	NA
	MWA-03-101205	10/12/05	3.29	16.87	13.340	473.3	NM ¹	1452.8	OR >200
	MWA-03-102605	10/26/05	3.32	17.26	10.550	395.4	1.07	85.0	OR >200
	MWA-03-112205	11/22/05	3.11	14.51	10.405	245.3	1.00	125.8	OR >200
	MWA-03-011306	1/13/06	6.42	15.60	1.481	17.7	4.06	10.9	
MWA-4	MWA-04-072905	7/29/05	6.40	17.81	2.107	11.4	155.00	4.5	NA
	MWA-04-101205	10/12/05	5.43	16.86	3.616	95.4	NM ¹	27.5	OR >200
	MWA-04-102605	10/26/05	3.25	17.54	5.626	499.3	1.78	28.6	OR >200
	MWA-04-112205	11/22/05	3.52	16.04	4.485	144.9	1.52	7.0	OR >200
	MWA-04-011306	1/13/06	5.43	16.18	3.607	16.0	1.10	15.7	
MWA-5	MWA-05-072805	7/28/05	6.14	18.19	3.079	-21.4	2.40	9.5	NA
	MWA-05-101105	10/11/05	6.89	16.89	2.732	-151.2	NM ¹	8.0	ND <50
	MWA-05-102705	10/27/05	7.26	15.53	2.904	-103.6	0.08	2.0	70.00
	MWA-05-112105	11/21/05	7.08	13.51	3.050	51.7	0.20	2.5	65.00
	MWA-05-011606	1/16/06	7.39	14.04	3.392	6.1	0.19	0.7	
MWA-6r	MWA-6r-080105	8/1/05	8.17	18.12	14.790	77.9	2.99	42.9	NA
MWA-15r	MWA-15r-080105	8/1/05	6.21	18.99	4.810	67.5	218.00	38.3	NA
	MWA-15r-091605	9/16/05	5.60	17.79	4.521	281.1	6.70	24.4	
MWA-18	MWA-18-080305	8/3/05	6.58	19.39	3.57	-36.2	3.55	12.8	NA
MWA-19	MWA-19-080305	8/3/05	7.00	19.57	7.208	-18.3	2.43	57.9	NA
MWA-20	MWA-20-080305	8/3/05	9.33	19.95	3.879	-49.0	1.76	31.0	NA
MWA-22	MWA-22-080105	8/1/05	11.61	19.02	20.25	-42.6	1.92	29.6	NA
MWA-30	MWA-30-080305	8/3/05	6.30	16.99	193.3	-10.6	0.47	10.0	NA
MWA-42	MWA-42-080205	8/2/05	9.28	19.63	4.846	-257.4	2.57	26.5	NA
MWA-44	MWA-44-080305	8/3/05	9.79	18.35	10.270	-46.9	0.78	129.2	NA
MWA-45	MWA-45-080305	8/3/05	9.51	18.56	9.174	-54.7	0.41	43.9	NA
MWA-46	MWA-46-080305	8/3/05	7.19	18.35	6.36	-12.80	1.50	49.4	NA
MWA-60	MWA-60-080205	8/2/05	6.82	18.52	3.300	-20.5	3.60	444.5	NA
	MWA-60-101105	10/11/05	5.25	16.59	4.917	242.4	NM ¹	82.5	OR >200
	MWA-60-102705	10/27/05	5.89	15.79	2.886	138.6	0.20	111.2	OR >200
	MWA-60-112105	11/21/05	5.55	15.01	5.182	63.9	0.33	2.5	OR >200
	MWA-60-011606	1/16/06	6.10	13.84	1.358	23.1	2.23	12.3	
MWA-61	MWA-61-080105	8/1/05	5.65	18.65	5.945	122.1	2.21	61.9	NA
	MWA-61-101205	10/12/05	4.25	16.90	5.294	473.5	NM ¹	34.0	OR >200
	MWA-61-102605	10/26/05	3.86	16.50	5.275	367.1	0.64	10.2	OR >200
	MWA-61-112105	11/21/05	3.50	16.32	5.385	179.8	0.43	18.9	NA
	MWA-61-011306	1/13/06	5.71	16.14	2.351	18.7	2.20	7.1	
MWA-62	MWA-62-080205	8/2/05	5.27	17.51	0.557	147.7	2.84	412.0	NA
	MWA-62-101205	10/12/05	5.13	16.24	0.659	191.2	NM ¹	25.1	70.00
	MWA-62-102505	10/25/05	5.09	17.01	1.263	109.8	0.12	15.0	125.00
	MWA-62-112205	11/22/05	4.79	15.68	1.392	142.6	0.37	10.0	100.00
	MWA-62-011606	1/16/06	5.67	13.86	1.626	23.8	2.62	8.1	
MWA-63	MWA-63-072705	7/27/05	5.89	28.00	3.363	8.6	4.47	0.4	NA
	MWA-63-101105	10/11/05	5.80	17.48	3.948	78.0	NM ¹	4.9	ND <50
	MWA-63-101705	10/17/05	6.02	16.27	3.947	70.8	0.50	10.8	ND <50
	MWA-63-112105	11/21/05	6.25	14.60	2.347	53.8	3.59	7.3	ND <50

Table 3

*Field Parameters Measured in Groundwater
Persulfate Oxidation Interim Remedial Measure
Arkema, Inc. Facility
Portland, Oregon*

Well Number	Sample Number	Date	pH	Temp. (deg. C)	EC (mS/cm)	ORP (mV)	DO (mg O ₂ /L)	Turbidity (NTU)	Field Sulfate (mg/L)
MWA-69	MWA-69-080205	8/2/05	6.21	17.35	4.519	-5.3	4.40	24.0	NA
	MWA-69-101305	10/13/05	3.46	16.71	15.88	441.8	NM ¹	204.3	OR >200
	MWA-69-102505	10/25/05	3.11	17.21	10.45	473.2	0.06	139.3	OR >200
	MWA-69-112205	11/22/05	2.72	16.33	9.194	207.1	0.29	114.6	NA
	MWA-69-011606	1/16/06	6.25	15.13	6.593	12.3	0.10	128.0	
NMP-3D	NMP-3D-080205	8/2/05	3.22	19.07	9.68	357.8	3.11	56.6	NA
	NMP-3D-091505	9/15/05	3.27	18.18	6.294	346.2	7.18	59.8	
NMP-4D	NMP-4D-072905	7/29/05	5.27	21.20	8.494	132.7	4.26	31.4	NA
	NMP-4D-091505	9/15/05	5.59	19.18	8.433	179.0	13.16	17.0	
PMP-4	PMP-4-072905	7/29/05	4.38	19.02	2.746	178.7	6.64	39.9	NA
	PMP-4-091505	9/15/05	4.33	17.87	2.082	379.0	10.73	77.1	NA
	PMP-4-101105	10/11/05	4.35	17.52	2.869	329.1	NM ¹	17.6	OR >200
	PMP-4-102705	10/27/05	4.25	16.51	2.95	231.1	2.28	26.7	OR >200
	PMP-4-112205	11/22/05	3.93	15.27	3.855	132.3	5.03	5.0	NA
PMP-5	PMP-5-072905	7/29/05	3.86	19.39	8.078	251.8	4.02	9.7	NA
	PMP-5-091505	9/15/05	3.71	17.01	7.16	432.1	7.44	23.9	NA
	PMP-5-101205	10/12/05	3.65	16.04	8.028	370.6	NM ¹	23.8	OR >200
	PMP-5-102705	10/27/05	3.61	16.69	9.65	254.2	0.76	25.2	OR >200
	PMP-5-112205	11/22/05	3.35	15.75	10.023	135.8	3.21	21.4	OR >200
PMP-6	PMP-6-072905	7/29/05	4.33	19.16	6.592	252.7	4.48	114.8	NA
	PMP-6-091405	9/14/05	3.77	19.31	6.113	329.5	10.66	39.0	NA
	PMP-6-101205	10/12/05	3.78	17.35	5.974	359.9	NM ¹	6.8	OR >200
	PMP-6-102705	10/27/05	3.70	17.11	6.632	232.1	1.02	361.2	OR >200
	PMP-6-112205	11/22/05	3.41	16.58	6.29	134.6	2.26	134.4	OR >200
<i>Shallow Intermediate Zone</i>									
MWA-17si	MWA-17si-072905	7/29/05	4.26	17.71	7.744	206.4	2.86	29.2	NA
	MWA-17si-101205	10/12/05	3.33	17.82	20.28	513.1	NM ¹	11.4	OR >200
	MWA-17si-102605	10/26/05	3.21	17.97	17.61	406.7	0.53	2.8	OR >200
	MWA-17si-112105	11/21/05	2.90	15.92	17.036	265.8	0.26	2.5	OR >200
	MWA-17si-011306	1/13/06	3.39	16.44	11.25	53.9	0.69	4.4	
MWA-67si	MWA-67si-080105	8/1/05	3.76	19.17	12.35	279.8	3.70	17.1	NA
	MWA-67si-101305	10/13/05	3.75	16.85	12.63	387.7	NM ¹	15.1	OR >200
	MWA-67si-102605	10/26/05	3.63	16.28	12.51	291.1	8.08	7.1	OR >200
	MWA-67si-112105	11/21/05	3.45	16.21	12.189	80.2	0.42	0.4	OR >200
	MWA-67si-011306	1/13/06	3.78	15.85	12.29	15.7	1.05	1.0	
MWA-68si	MWA-68si-080205	8/2/05	5.71	18.35	4.059	-37.1	4.25	18.1	NA
	MWA-68si-101305	10/13/05	5.11	16.46	5.24	40.8	NM ¹	12.1	OR >200
	MWA-68si-102505	10/25/05	2.52	16.88	8.754	500.8	0.41	8.2	OR >200
	MWA-68si-112205	11/22/05	2.36	16.60	9.442	489.7	0.23	6.4	OR >200
	MWA-68si-011306	1/13/06	3.23	15.32	7.036	107.4	0.86	9.3	
<i>Intermediate Zone</i>									
MWA-8i	MWA-8i-072805	7/28/05	9.26	18.65	8.770	186.5	1.34	3.7	NA
	MWA-8i-091505	9/15/05	9.63	17.07	7.811	-211.5	3.07	5.1	NA
	MWA-8i-101305	10/13/05	9.65	16.08	7.588	-344.4	NM ¹	6.2	NA
	MWA-8i-102705	10/27/05	9.59	14.02	7.818	-350.5	0.68	32.4	OR >200
	MWA-8i-112105	11/21/05	9.63	15.24	7.737	61.0	0.14	4.0	150.00
MWA-9i	MWA-9i-072905	7/29/05	5.75	16.93	10.33	-88.3	3.34	15.9	NA
	MWA-9i-091505	9/15/05	6.19	17.60	12.86	-81.9	10.24	43.7	NA
	MWA-9i-101205	10/12/05	6.05	16.53	11.9	-79.2	NM ¹	28.8	OR >200
	MWA-9i-102605	10/26/05	6.04	16.64	12	-55.1	0.53	39.5	OR >200
	MWA-9i-112205	11/22/05	5.77	15.09	12.97	143.9	0.30	28.5	200.00

Table 3

*Field Parameters Measured in Groundwater
 Persulfate Oxidation Interim Remedial Measure
 Arkema, Inc. Facility
 Portland, Oregon*

Well Number	Sample Number	Date	pH	Temp. (deg. C)	EC (mS/cm)	ORP (mV)	DO (mg O ₂ /L)	Turbidity (NTU)	Field Sulfate (mg/L)
MWA-10i	MWA-10i-072905	7/29/05	6.41	18.30	5.932	14.2	2.49	2.2	NA
	MWA-10i-101205	10/12/05	6.32	16.69	6.406	-33.6	NM ¹	13.2	OR >200
	MWA-10i-102605	10/26/05	7.60	16.53	4.233	249.3	0.36	8.6	OR >200
	MWA-10i-112205	11/22/05	5.99	15.43	6.205	135.1	0.45	0.8	OR >200
MWA-11i	MWA-11i-080105	8/1/05	6.60	19.45	2.764	-129.4	1.47	40.2	NA
MWA-14i	MWA-14i-072805	7/28/05	7.27	19.09	6.738	-62.9	3.20	5.6	NA
	MWA-14i-101105	10/11/05	6.71	17.11	7.127	-72.7	NM ¹	0.5	OR >200
	MWA-14i-102705	10/27/05	7.39	15.47	6.265	35.8	0.13	0.6	150.00
	MWA-14i-112105	11/21/05	6.98	13.43	7.063	52.8	0.29	0.3	150.00
MWA-16i	MWA-16i-080205	8/2/05	7.12	17.84	10.38	-11.8	3.99	4.4	NA
MWA-32i	MWA-32i-080305	8/3/05	7.30	17.19	40.31	1.4	0.75	8.1	NA
MWA-34i	MWA-34i-080305	8/3/05	10.46	20.54	16.78	-74.0	0.99	4.0	NA
MWA-49i	MWA-49i-080305	8/3/05	6.13	19.31	35.95	28.4	1.29	21.8	NA
MWA-51i	MWA-51i-080305	8/3/05	9.05	19.32	29.97	-76.8	0.80	4.6	NA
MWA-55i	MWA-55i-080305	8/3/05	9.83	19.42	41.63	-76.4	0.33	11.3	NA
MWA-64i	MWA-64i-080105	8/1/05	7.86	20.79	7.219	-153.0	1.52	53.9	NA
MWA-65i	MWA-65i-080205	8/2/05	5.52	18.25	5.228	108.3	5.51	90.7	NA
MWA-66i	MWA-66i-080205	8/2/05	5.35	19.31	4.944	91.6	4.88	15.9	NA

Notes:

1 = DO Meter Malfunctioned